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Reteaching

3.1 Solving Equations by Adding and Subtracting

◆ **Skill A** Solving addition equations

Recall **Subtraction Property of Equality:** If equal amounts are subtracted from the expressions on each side of an equation, the expressions remain equal.

◆ **Example**

Solve $x + 80 = 230$ by using the Subtraction Property of Equality.

◆ **Solution**

$$x + 80 = 230$$
$$x + 80 - 80 = 230 - 80 \qquad \text{Subtract 80 from each side of the equation.}$$
$$x = 150$$

Solve each equation. Check the solution.

1. $8 + t = 64$ ______

2. $x + 19 = -25$ ______

3. $y + 4.9 = 11$ ______

4. $6 + m = -34$ ______

5. $r + 5.8 = -10.2$ ______

6. $x + 12 = 7$ ______

7. $z + \frac{3}{4} = 1\frac{3}{20}$ ______

8. $a + 15 = 12$ ______

9. $6.8 + b = -4.7$ ______

10. $x + \frac{1}{10} = \frac{1}{5}$ ______

11. The student council needs to raise \$5000, but so far they have raised only \$2790. Write and solve an equation to find how much money still needs to be raised.

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12. In any triangle, the sum of the measures of the angles is 180°. Given $\triangle ABC$ with $m\angle A = 35°$ and $m\angle B = 90°$, write and solve an equation to find $m\angle C$.

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◆ Skill B Solving subtraction equations

Recall **Addition Property of Equality:** If equal amounts are added to the expressions on each side of an equation, the expressions remain equal.

◆ **Example 1**

Solve the equation $y - 32 = 65$ by using the Addition Property of Equality.

◆ **Solution**

$$y - 32 = 65$$

$$y - 32 + 32 = 65 + 32 \qquad \text{Add 32 to each side of the equation.}$$

$$y = 97$$

◆ **Example 2**

Solve the equation $12 - x = 10$ by using the Subtraction Property of Equality.

◆ **Solution**

$$12 - x = 10$$

$$12 - x - 12 = 10 - 12 \qquad \text{Subtract 12 from each side of the equation.}$$

$$-x = -2$$

$$x = 2 \qquad \text{The opposite of } x \text{ is } -2\text{; therefore, } x = 2$$

Solve each equation.

13. $x - 3 = 15$ ______________________

14. $t - 8 = -34$ ______________________

15. $18 = y - 7$ ______________________

16. $m - 2.4 = 18$ ______________________

17. $b - 3.8 = -13.3$ ______________________

18. $275 = x - 365$ ______________________

19. $y - 3\frac{5}{6} = 4\frac{2}{3}$ ______________________

20. $10 - a = 15$ ______________________

21. $1.8 - x = 0.2$ ______________________

22. $2\frac{7}{8} - y = -4\frac{1}{8}$ ______________________

23. $225 - b = 45$ ______________________

24. $17.5 - c = 28.2$ ______________________

25. If you spend \$60 of your weekly paycheck and have \$215 left, write and solve an equation to find the original amount of your weekly paycheck.

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Reteaching

3.2 Solving Equations by Multiplying and Dividing

◆ **Skill A** Solving multiplication equations

Recall **Division Property of Equality:** If each side of an equation is divided by a nonzero number, the results of both sides are equal.

◆ **Example 1**

Solve $-6x = 30$.

◆ **Solution**

$\frac{-6x}{-6} = \frac{30}{-6}$ Divide each side of the equation by -6.

$x = -5$ Simplify.

◆ **Example 2**

Solve $3w = -11$.

◆ **Solution**

$\frac{3w}{3} = \frac{-11}{3}$ Divide each side of the equation by 3.

$w = \frac{-11}{3}$, or $-3\frac{2}{3}$

Solve each equation and check your solution.

1. $-6d = -42$ ______________

2. $8y = -40$ ______________

3. $-7a = 49$ ______________

4. $18x = -216$ ______________

5. $-5s = -85$ ______________

6. $3t = 64$ ______________

7. $-12x = -144$ ______________

8. $-5x = 22$ ______________

Write and solve an equation for each situation.

9. If the perimeter of a square is 14 inches, what is the measurement of one of its sides?

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10. Ricky earns $4.50 per hour working at the arcade. If he made $101.25 this week, how many hours did he work?

____

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◆ Skill B Solving division equations

Recall **Multiplication Property of Equality:** If each side of an equation is multiplied by the same number, the results of both sides are equal.

◆ **Example 1**

Solve $\frac{x}{11} = -25$.

◆ **Solution**

$(11)\frac{x}{11} = (11)(-25)$ Multiply each side of the equation by 11.

$x = -275$ Simplify.

◆ **Example 2**

Solve $\frac{y}{-3} = 9$.

◆ **Solution**

$(-3)\frac{y}{-3} = (-3)9$ Multiply each side of the equation by -3.

$y = -27$

Solve each equation and check your solution.

11. $11 = \frac{m}{5}$ ____________

12. $-10 = \frac{y}{-7}$ ____________

13. $\frac{a}{-4} = -16$ ____________

14. $\frac{x}{2} = -34$ ____________

15. $\frac{t}{13} = -24$ ____________

16. $\frac{n}{-12} = 4$ ____________

17. $\frac{x}{-3.6} = 14$ ____________

18. $\frac{y}{-4.9} = -9.8$ ____________

Write and solve an equation for each situation.

19. The slope of a line equals the change in *y* divided by the corresponding change in *x*. If the slope of a line is -6 and the change in *y* is 8.2, what is the change in *x*?

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20. A basketball team received a care package and split it evenly among 5 players. If each player received 9 candy bars, how many candy bars were in the care package?

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Reteaching

3.3 Solving Two-Step Equations

◆Skill A Solving two-step equations

Recall To solve equations, use addition, subtraction, multiplication, or division to isolate the variables.

◆ Example 1

Solve $3x + 2 = 17$.

◆ Solution

$3x + 2 = 17$

$3x + 2 - 2 = 17 - 2$ Subtract 2 from each side of the equation.

$\frac{3x}{3} = \frac{15}{3}$ Divide each side of the resulting equation by 3.

$x = 5$

◆ Example 2

Solve $\frac{x}{3} - 4 = 1$.

◆ Solution

$\frac{x}{3} - 4 = 1$

$\frac{x}{3} - 4 + 4 = 1 + 4$ Add 4 to each side of the equation.

$(3)\frac{x}{3} = 5(3)$ Multiply each side of the resulting equation by 3.

$x = 15$

Solve each equation.

1. $3x + 2 = 8$ ____________
2. $2t - 4 = 8$ ____________
3. $5y + 10 = 30$ ____________
4. $7x + 2 = 37$ ____________
5. $-2 + 7x = 33$ ____________
6. $-2 + \frac{z}{2} = 1$ ____________
7. $\frac{s}{4} + 2 = 6$ ____________
8. $9w - 4 = 77$ ____________
9. $20 + 2f = 2$ ____________
10. $10 + 6c = 52$ ____________
11. $8x - 5 = 43$ ____________
12. $2 - \frac{t}{9} = 11$ ____________
13. $32x + \frac{1}{2} = 16.5$ ____________
14. $16x - \frac{1}{4} = 63.75$ ____________
15. $-72 + 14j = -2$ ____________
16. $-4 + 6k = -34$ ____________

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◆ **Skill B** Write and solve equations that represent real-world situations

Recall To solve a real-world problem, choose a variable to represent the unknown and then write an equation using that variable.

◆ **Example**

The cost of going to the show includes admission plus refreshments. Suppose the admission is $7.50, a bag of popcorn costs $3.00, and 4 friends go to the show together. Find how many bags of popcorn the friends bought if the total cost for the group was $39.00.

◆ **Solution**

Let x represent the number of bags of popcorn.

Admission + Cost of popcorn = Total cost

$4 \cdot 7.50 + 3x = 39$

$30 + 3x = 39$

$30 - 30 + 3x = 39 - 30$ Subtract 30 from each side.

$3x = 9$

$x = 3$ Divide each side by 3.

The friends shared 3 bags of popcorn.

Write an equation and solve each problem.

17. Maria purchased 8 hats for $10 each and 6 scarves of equal value. Her total bill was $290. How much did each scarf cost?

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18. Manuel bought a set of tracks for $35 and 8 individual train cars, which were priced the same. If the total cost was $155, what was the price for each train car?

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19. The Pep Club planned to sell streamers for 50¢ each. They also raised $100 selling pom poms. How many streamers would they need to sell in order to raise a total of $150?

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Reteaching

3.4 Solving Multistep Equations

◆**Skill A** Solve multistep equations with variables on both sides

Recall To solve an equation with variables on both sides, you must isolate the variable.

◆ **Example**

Solve $4x - 3 = 2x + 5$.

◆ **Solution**

$4x - 3 = 2x + 5$

$4x - 3 - 2x = 2x + 5 - 2x$ Get all the terms with x on the left side of the equation.

$2x - 3 = 5$

$2x = 8$ Solve as a two-step equation.

$x = 4$

Solve and check each equation.

1. $2x + 1 = 5x - 2$ ______________________

2. $8y - 7 = 7y - 15$ ______________________

3. $4a + 2 = 8a + 18$ ______________________

4. $9x + 6 = 26 - x$ ______________________

5. $12t - 19 = 15t + 8$ ______________________

6. $13 - 6x = 6x + 1$ ______________________

7. $4y - 11 = 9 - 4y$ ______________________

8. $15b + 14 = 5b + 4$ ______________________

9. $30w - 50 = 12w - 14$ ______________________

10. $7p - 10 = 12 - 4p$ ______________________

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◆ **Skill B** Solve multi-step equations by clearing the equation of fractions

Recall The least common denominator of two fractions is the smallest number that is a multiple of the denominator of both fractions.

◆ **Example**

Solve $\frac{x}{2} + \frac{1}{3} = \frac{4x}{3} - \frac{1}{2}$

◆ **Solution**

$\frac{x}{2} + \frac{1}{3} = \frac{4x}{3} - \frac{1}{2}$	The least common denominator is 6.
$6\left(\frac{x}{2} + \frac{1}{3}\right) = 6\left(\frac{4x}{3} - \frac{1}{2}\right)$	Multiply each side of the equation by 6.
$6 \cdot \frac{x}{2} + 6 \cdot \frac{1}{3} = 6 \cdot \frac{4x}{3} - 6 \cdot \frac{1}{2}$	Distributive Property
$3x + 2 = 8x - 3$	
$3x + 2 - 3x = 8x - 3 - 3x$	Isolate the variable.
$2 = 5x - 3$	
$5 = 5x$	Add 3 to both sides.
$x = 1$	Divide both sides by 5.

Solve and check each equation.

11. $\frac{5x}{4} = 3 + \frac{x}{2}$ ______________________

12. $\frac{3}{4} - 3x = \frac{1}{4} + x$ ______________________

13. $\frac{1}{5} + 2n = \frac{2}{3} + 3n$ ______________________

14. $\frac{m}{3} = \frac{m}{2} - 1$ ______________________

15. $\frac{x}{8} = \frac{x}{4} + 2$ ______________________

16. $\frac{5y}{6} - 1 = \frac{3y}{4} + 2$ ______________________

17. Georgia has scored 83 and 94 on her first two history tests. What score does she need on her third test so that her average score will be exactly 90?

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Reteaching

3.5 *Using the Distributive Property*

◆Skill A Solving multistep equations with variables inside parentheses

Recall Use the Distributive Property to help simplify the equation by removing the parentheses.
Distributive Property: $a(b + c) = ab + ac$ and $a(b - c) = ab - ac$

◆ Example 1
Solve $2(6x + 4) = 68$.

◆ Solution

$2(6x + 4) = 68$	Given
$2(6x) + 2(4) = 68$	Distributive Property
$12x + 8 = 68$	Simplify.
$12x = 60$	Subtraction Property of Equality
$x = 5$	Division Property of Equality

◆ Example 2
Solve $9t - 3(2t - 5) = 45$.

◆ Solution

$9t - 3(2t - 5) = 45$	Given
$9t - [3(2t) - 3(5)] = 45$	Distributive Property
$9t - 6t + 15 = 45$	Simplify.
$3t + 15 = 45$	Combine like terms.
$3t = 30$	Subtraction Property of Equality
$t = 10$	Division Property of Equality

Solve each equation.

1. $6(x + 2) = -24$ ______________

2. $3(2t + 4) = 42$ ______________

3. $9(z + 2) = 45$ ______________

4. $8(k + 20) = 52$ ______________

5. $2(x + 2) + 4 = 16$ ______________

6. $6(3m - 2) = 24$ ______________

7. $2h + 2(2h + 4) = 26$ ______________

8. $7(2n + 3) = 91$ ______________

9. $8(3t + 2) - 60 = 28$ ______________

10. $-4(8c + 2) - 52 = 100$ ______________

11. $4(2f - 3) + 3 = 39$ ______________

12. $5(3y + 2) + 10 = 105$ ______________

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◆ Skill B Solving real-world problems that use equations with parentheses

Recall To solve real-world problems, you must choose a variable and write an equation that models the situation.

◆ **Example**

The Bargain Books Store offers discounts of 50¢ per book when you buy more than 5 titles at one time. If you pay \$33.75 for 5 books of equal value, what was the original cost of each book?

◆ **Solution**

Let x represent the cost of each book. The discounted price is $x - 0.50$.

5(discounted price) = 33.75		
$5(x - 0.50) = 33.75$		
$5x - 2.50 = 33.75$	Distributive Property
$5x = 36.25$	Add 2.50 to each side.
$x = 7.25$	Divide each side by 5.

Each book originally cost \$7.25.

Write and solve an equation for each problem.

13. The CD club offers a discount when you purchase 3 or more CDs. If the price of each CD is reduced by \$1.50 and the cost of 3 CDs is \$35.97, find the original price of each CD.

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14. Write and solve an equation to determine the value of x for which the perimeter of the rectangle will equal the perimeter of the square.

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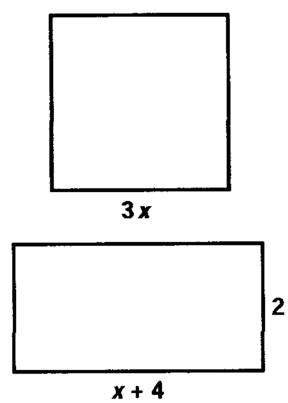

15. A Chinese restaurant has the family special shown at right. What is the original average cost of the entrees if the discount is \$2 per entree?

ANY FOUR
ENTREES FOR \$20

____

16. Acme car rental agency charges a fee of \$29 per day plus \$0.15 per mile. Travel Ease car rental agency charges \$20 per day plus \$0.25 per mile. For a one-day trip, what mileage would make the two rates equal?

____

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Reteaching

3.6 Using Formulas and Literal Equations

◆Skill A Rewriting a formula or a literal equation

Recall A literal equation is an equation that contains different variables. Sometimes a formula is called a literal equation when the variables represent specific quantities.

◆ Example 1

Given the formula $A = P + I$, write a formula for the principal, P, based on the interest, I, and amount, A.

◆ Solution

$A = P + I$	Given
$A - I = P + I - I$	Subtract I from each side of the equation.
$A - I = P$	
$P = A - I$	

◆ Example 2

Solve the equation $6x + 2y = 8$ for y.

◆ Solution

$6x + 2y = 8$	Given
$6x + 2y - 6x = 8 - 6x$	Isolate the y-term.
$2y = 8 - 6x$	
$\frac{2y}{2} = \frac{8 - 6x}{2}$	
$y = 4 - 3x$	Simplify.

Solve each equation for the indicated variable.

1. $x - y = 10$, for x ______________________

2. $x + y = z$, for y ______________________

3. $x - z = -y$, for z ______________________

4. $a + x = 2y$, for x ______________________

5. $x + y - z = 32$, for y ______________________

6. $d = rt$, for t ______________________

7. $A = \frac{1}{2}bh$, for h ______________________

8. $3x + 5y = 15$, for x ______________________

9. $12x - 6y = 18$, for y ______________________

10. $p = 2(l + w)$, for l ______________________

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◆ **Skill B** Using formulas to solve problems

Recall When you have values for some of the quantities in a formula, you can use substitution to find the value of the remaining quantity.

◆ **Example**

The formula for the area of a parallelogram is $A = bh$. If the area of a parallelogram is 60 square inches and the height is 10 inches, find the base.

◆ **Solution**

$A = bh$

$60 = b(10)$ Substitute

$\frac{60}{10} = \frac{b(10)}{10}$ Divide both sides by 10.

$6 = b$

$b = 6$

Thus, the base is 6 inches.

Solve each problem.

11. Use the formula for perimeter, $p = 2l + 2w$. Find w when $p = 30$ and $l = 12$.

____

12. Use the formula for circumference of a circle, $C = 2\pi r$. Find r when $C = 14\pi$.

____

13. The formula for the area of a triangle is $A = \frac{1}{2}bh$. If the area of a triangle is 75 square meters and the base has a length of 15 meters, find the height.

____

14. The formula for distance is $d = rt$, where d is distance, r is rate, and t is time. If you travel at 80 kilometers per hour, find the amount of time that it will take to travel 320 kilometers.

____

15. The formula for profit is $P = R - C$, where P is profit, R is revenue, and C is cost. If a company makes $15,000 in revenue and $8000 in profit, find the cost.

____

16. The formula $P_1V_1 = P_2V_2$ is called Boyle's Law. P_1 and P_2 represent the pressure applied to a gas at two different times, and V_1 and V_2 represent the volume of the gas at those times. If the volume of the gas is 4 liters when the pressure is 8kPa, find the pressure when the volume is 2 liters. (kPa is the unit that measures pressure.)

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Reteaching
7.1 Graphing Systems of Equations

◆ **Skill A** Solving systems of equations by graphing

Recall Write each equation in slope-intercept form, $y = mx + b$. Then graph both equations on the same coordinate plane. The solution is the point where the lines intersect.

◆ **Example**

Solve the system of equations.

$$\begin{cases} y = -x + 2 \\ 2x - y = 1 \end{cases}$$

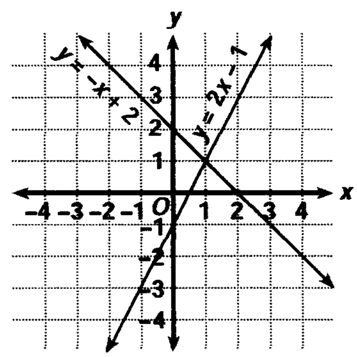
◆ **Solution**

The first equation is already solved for y. Solve the second equation for y.

$2x - y = 1$	
$2x - (2x) - y = 1 - (2x)$	Subtraction Property of Equality
$\dfrac{-y}{-1} = \dfrac{(1 - 2x)}{-1}$	Division Property of Equality
$y = -1 + 2x$	Simplify.
$y = 2x - 1$	Commutative Property of Addition

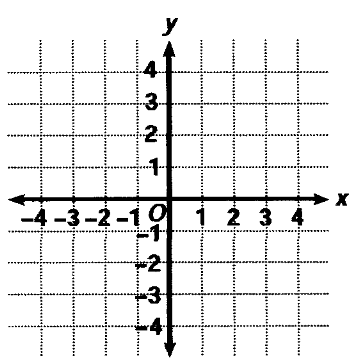
The graphs of both equations are shown.

The lines intersect at (1, 1), so the solution is (1, 1).

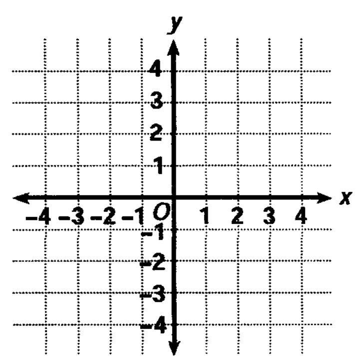


Solve by graphing. Check by substituting your solution into the original equations.

1. $\begin{cases} y = x \\ x + y = 4 \end{cases}$



2. $\begin{cases} x + y = 3 \\ y = 2x \end{cases}$



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Practice Masters Level A

7.1 Graphing Systems of Equations

Determine whether the given point is a solution of the system of equations.

1. $(1, 3)$ $\begin{cases} y = 5x - 2 \\ y = -3x + 6 \end{cases}$ ____________

2. $(7, 5)$ $\begin{cases} y = 2x + 1 \\ y = x - 2 \end{cases}$ ____________

3. $(-1, 9)$ $\begin{cases} y = 14x + 5 \\ y = -7x + 2 \end{cases}$ ____________

4. $(0, 4)$ $\begin{cases} y = 4x + 4 \\ y = 15x + 4 \end{cases}$ ____________

5. $(1, 1)$ $\begin{cases} y = 9x - 8 \\ y = -14x + 15 \end{cases}$ ____________

6. $(2, 13)$ $\begin{cases} y = 8x - 4 \\ y = x + 10 \end{cases}$ ____________

7. $(5, -3)$ $\begin{cases} y = -x + 3 \\ y = 7x - 27 \end{cases}$ ____________

8. $(16, 3)$ $\begin{cases} y = 4x - 61 \\ y = -2x + 35 \end{cases}$ ____________

Write each equation in slope-intercept form.

9. $2x + 6y = -5$ ____________

10. $7y - 14x - 21 = 0$ ____________

11. $3 + 4y = 16x$ ____________

12. $-y - 5x = 25$ ____________

13. $8 = 12y + 6x$ ____________

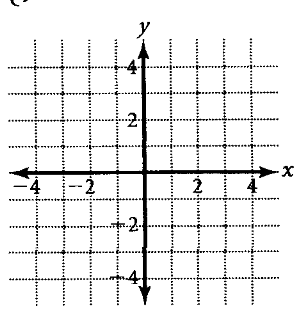
14. $13 - 4y = 2x$ ____________

15. $6(x + 3y) = 36$ ____________

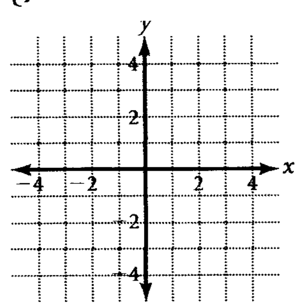
16. $18x + 18y = 36$ ____________

Solve by graphing.

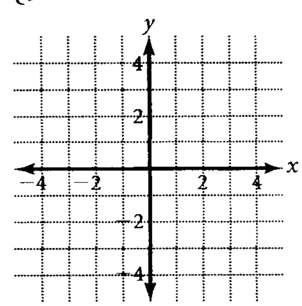
17. $\begin{cases} y = x - 1 \\ y = 3x + 1 \end{cases}$ ____________



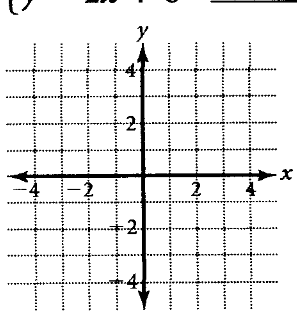
18. $\begin{cases} y = -x - 3 \\ y = 2x - 6 \end{cases}$ ____________



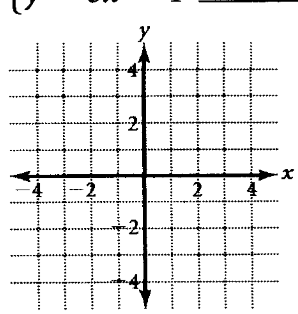
19. $\begin{cases} y = 2x + 5 \\ y = 4x + 5 \end{cases}$ ____________



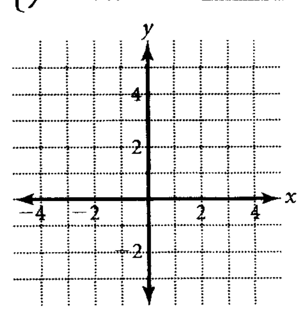
20. $\begin{cases} y = -x + 3 \\ y = 2x + 6 \end{cases}$ ____________



21. $\begin{cases} y = x - 2 \\ y = 3x - 4 \end{cases}$ ____________



22. $\begin{cases} y = 3x - 4 \\ y = 2x - 2 \end{cases}$ ____________



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Reteaching

7.2 The Substitution Method

◆ Skill A Solving a system of equations by using substitution

Recall Solve one of the equations for one of the variables. Then substitute the right side of the new equation for that variable in the other equation. The result will be an equation with only one variable. Solve for this variable. Then find the solution for the remaining variable in one of the original equations.

◆ Example

Solve by using substitution.

$$\begin{cases} x + 6y = 1 \\ 3x - 10y = 31 \end{cases}$$

◆ Solution

Solve for x in the first equation.

$$x + 6y = 1$$
$$x = 1 - 6y$$

Substitute $1 - 6y$ for x in the second equation.

$$\begin{aligned} 3x - 10y &= 31 \\ 3(1 - 6y) - 10y &= 31 \\ 3 - 18y - 10y &= 31 \\ 3 - 28y &= 31 \\ -28y &= 28 \\ y &= -1 \end{aligned}$$

Given $y = -1$, solve for x.

$$\begin{aligned} x + 6y &= 1 \\ x + -6(-1) &= 1 \\ x &= 7 \end{aligned}$$

Thus, the solution is $(7, -1)$.

Check the solution in both of the original equations in order to make sure that your answer is correct.

Solve by using substitution, and check your answers.

1. $\begin{cases} y = 4x \\ 4x + 5y = -24 \end{cases}$ ______________

2. $\begin{cases} y = 2 \\ 2x - 4y = 1 \end{cases}$ ______________

3. $\begin{cases} 2x - 4y = 20 \\ \frac{x}{3} - y = 3 \end{cases}$ ______________

4. $\begin{cases} 3y = 3x - 3 \\ 3x + 3y = 9 \end{cases}$ ______________

5. $\begin{cases} -3x + y = -4 \\ -2x + 3y = 9 \end{cases}$ ______________

6. $\begin{cases} -x + 2y = -5 \\ -3x + 5y = -8 \end{cases}$ ______________

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◆ Skill B Solving word problems using substitution

Recall Define the variables. Then write and solve the resulting system of equations.

◆ **Example**

The sum of two angles is 180°. The measure of the larger angle is 124° more than the measure of the smaller angle. Find the measure of each angle.

◆ **Solution**

Let x represent the measure of the larger angle and let y represent the measure of the smaller angle.

Write a system of equations: $\begin{cases} x + y = 180 \\ y = x + 124 \end{cases}$

Solve the system by substitution. Substitute the value of y from the second equation for y in the first equation. Then solve for x.

$$x + (x + 124) = 180$$
$$2x + 124 = 180$$
$$2x = 56$$
$$x = 28$$

Given $x = 28$, solve for y.

$y = x + 124 = 28 + 124 = 152$

The measure of the larger angle is 152°. The measure of the smaller angle is 28°.

Write a system of equations for each problem. Solve by using the substitution method.

7. The sum of two numbers is 346. The smaller number is $\frac{1}{3}$ of the quantity 6 less than the larger number. Find the two numbers.

____

____

8. The sum of two angles is 90°. The smaller angle is $\frac{2}{3}$ the measure of the larger angle. Find the measures of the two angles.

____

____

9. Raul is 3 times as old as his sister Sara. The sum of their ages is 28. How old are Raul and Sara? ______________

10. If you have $8000 to invest for college and you are investing part at 7% interest and part at 5% interest, how much should you invest at each rate in order to get $500 in interest after one year? ______________

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Reteaching
7.3 The Elimination Method

◆**Skill A** Solving a system of equations by using addition or subtraction

Recall If the *x*- or *y*-terms in the two equations are opposites, you can eliminate the variable by using the Addition Property of Equality. If they have the same coefficients, you can eliminate the variable by using the Subtraction Property of Equality.

◆ **Example**

Solve by elimination.

$$\begin{cases} x - y = 8 \\ x + y = 2 \end{cases}$$

◆ **Solution**

Since *y* and $-y$ are opposites, use the Addition Property of Equality to combine equations. Then solve the resulting equation for *x*.

$$\begin{aligned} x - y &= 8 \\ x + y &= 2 \\ 2x &= 10 \\ x &= 5 \end{aligned}$$

Given $x = 5$, solve for *y* in either equation.

$$\begin{aligned} 5 + y &= 2 \\ y &= -3 \end{aligned}$$

Thus, the solution is $(5, -3)$.

Check the solution in both of the original equations in order to make sure that your answer is correct.

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Solve each system of equations by elimination, and check your solution.

1. $\begin{cases} 2x - 2y = -10 \\ 2x + 2y = 50 \end{cases}$

____

2. $\begin{cases} x + 3y = 5 \\ x + 2y = 3 \end{cases}$

____

3. $\begin{cases} 5x + y = 9 \\ -5x + y = 7 \end{cases}$

____

4. $\begin{cases} 3x - 12y = 18 \\ 9x + 12y = 30 \end{cases}$

____

5. $\begin{cases} 3x + 4y = 2 \\ 4x - 4y = 12 \end{cases}$

____

6. $\begin{cases} \frac{1}{2}x + y = 5 \\ \frac{3}{2}x - y = 30 \end{cases}$

____

◆Skill B Solving a system of equations by using multiplication

Recall If you multiply each side of an equation by the same number, the products are equal.

◆ **Example**
Solve by elimination. $\begin{cases} x + y = 6 \\ 2x - 3y = 2 \end{cases}$

◆ **Solution**
Multiply each side of the first equation by 2.

$$2(x + y) = 2(6)$$
$$2x + 2y = 12$$

This will result in equal but opposite x-terms in both equations.

$$2x + 2y = 12$$
$$2x - 3y = 2$$

Use the Subtraction Property of Equality to solve for y.

$$2y - (-3y) = 12 - 2$$
$$5y = 10$$
$$y = 2$$

Use $y = 2$ and the first equation to solve for x.

$$x + y = 6$$
$$x + 2 = 6$$
$$x = 4$$

Thus, the solution is (4, 2).

Check the solution in both of the original equations in order to make sure that your answer is correct.

Solve each system of equations by elimination and check your solution.

7. $\begin{cases} 2x - 10y = 0 \\ 4x - 6y = 14 \end{cases}$ ____________

8. $\begin{cases} 4x + y = 8 \\ x - 10y = 2 \end{cases}$ ____________

9. $\begin{cases} 3x - 8y = 9 \\ x - y = 2 \end{cases}$ ____________

10. $\begin{cases} 5x - 4y = 2 \\ 2x + y = 6 \end{cases}$ ____________

11. $\begin{cases} 3x - 2y = 10 \\ 2x - y = 8 \end{cases}$ ____________

12. $\begin{cases} 4x + 10y = 6 \\ -2x + 6y = -14 \end{cases}$ ____________

Write and solve a system of equations for the following problem.

13. The drama club sold T-shirts and baseball caps in a fund-raiser. The T-shirts sold for \$12, and the caps sold for \$9. The club sold a total of 114 shirts and caps. If the club raised \$1242, how many T-shirts and how many caps were sold? ____________

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Reteaching
7.4 *Consistent and Inconsistent Systems*

◆ **Skill A** Solving inconsistent systems

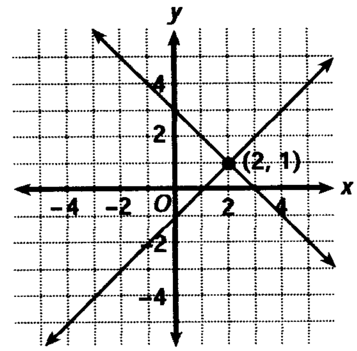
Recall The graphs of the equations in a system of equations can intersect in one point, in an infinite number of points, or in no points. If the system has one solution or infinitely many solutions, the system is called consistent. If there is no solution, the system is called inconsistent.

◆ **Example 1**

Is the system $\begin{cases} y = x - 1 \\ y = -x + 3 \end{cases}$ consistent?

◆ **Solution**

Graph the system.



From the graphs, you can see that the lines intersect. Thus, the system is consistent.

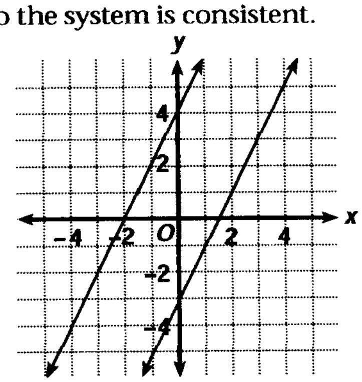
If you solve the system by using the Addition Property of Equality, the result will be $x = 2$ and $y = 1$. That is, the solution is (2, 1), so the system is consistent.

◆ **Example 2**

Is the system $\begin{cases} y = 2x + 4 \\ y = 2x - 3 \end{cases}$ consistent?

◆ **Solution**

Graph the system.



The lines are parallel. If you solve the system by using the Subtraction Property of Equality, the result is $0 = 1$.

There are no solutions to the system. The system is inconsistent.

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Solve each system algebraically. Identify each system as consistent or inconsistent.

1. $\begin{cases} 2y - 3x = 2 \\ 2y = 3x - 4 \end{cases}$ ____________________

2. $\begin{cases} 2x + 3y = 9 \\ 2x - 3y = 3 \end{cases}$ ____________________

3. $\begin{cases} y = 5x + 2 \\ y = -5x + 2 \end{cases}$ ____________________

4. $\begin{cases} y = x + 2 \\ x = y + 4 \end{cases}$ ____________________

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◆ Skill B Solving dependent systems

Recall There are two types of consistent systems, independent and dependent. An independent system has exactly one solution. A dependent system has infinitely many solutions. If a system is dependent, the graphs of both equations are the same line.

◆ **Example**
Solve the system algebraically. $\begin{cases} 2x - y = 5 \\ 4x - 2y = 10 \end{cases}$

Identify the system as consistent or inconsistent. If the system is consistent, determine whether it is independent or dependent.

◆ **Solution**
Solve the system by elimination.
Multiply the first equation by 2. $4x - 2y = 10$
Write the second equation as it is. $4x - 2y = 10$

When you apply the Subtraction Property of Equality, the result is $0 = 0$. Any ordered pair that solves the first equation will also solve the second equation.

There are infinitely many solutions to the system. Thus, the system is consistent and dependent.

Solve each system algebraically. Identify each system as consistent and dependent, consistent and independent, or inconsistent.

5. $\begin{cases} 4y = -2x - 6 \\ 2y = -x - 3 \end{cases}$

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____

6. $\begin{cases} x + y = 4 \\ x + y = 2 \end{cases}$

____

____

7. $\begin{cases} 5x + 3y = -6 \\ 2x + y = -4 \end{cases}$

____

____

8. $\begin{cases} x + 3y = 1 \\ 2x + 6y = 3 \end{cases}$

____

____

9. $\begin{cases} 3x + 6y = 3 \\ 2x + 4y = 2 \end{cases}$

____

____

10. $\begin{cases} 6x - 9y = 12 \\ 8x - 12y = 16 \end{cases}$

____

____

11. $\begin{cases} 2x - y = 2 \\ 3x - 2y = 1 \end{cases}$

____

____

12. $\begin{cases} 3x + y = 2.7 \\ x - 2y = -1.9 \end{cases}$

____

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Reteaching
7.6 Classic Puzzles in Two Variables

◆Skill A Solving age problems

Recall To solve an age problem, represent a person's age in the future or in the past.

◆ **Example**
Marge is 3 years older than Susan. Four years ago, Marge was twice as old as Susan. How old is Marge now?

◆ **Solution**
Let m represent Marge's age now and let s represent Susan's age now.

Write an equation comparing the ages of the girls now: $m = s + 3$.
Write an equation comparing their ages 4 years ago: $m - 4 = 2(s - 4)$.

Solving the system $\begin{cases} m = s + 3 \\ m - 4 = 2(s - 4) \end{cases}$ gives $s = 7$ and $m = 10$.

Thus, Marge is now 10 years old.

Write a system for each age problem. Then solve each problem.

1. Joel is 1 year younger than Roberto. The sum of their ages is 27. How old is each? ____________

2. Latisha is three times as old as her brother. In six years she will be twice as old as her brother. How old is Latisha now? ____________

◆Skill B Solving coin problems

Recall To solve a coin problem, write one equation relating the coins and another equation relating the values of the coins.

◆ **Example**
Paul has 25 dimes and nickels. He has a total of \$2.00.
How many dimes and nickels does Paul have?

◆ **Solution**
Let d represent dimes and let n represent nickels.
Paul has 25 coins. Thus, $d + n = 25$.
The dimes are worth $10d$ cents and the nickels are worth $5n$ cents.
He has \$2.00, or 200 cents. Thus, $10d + 5n = 200$.
Solving the system $\begin{cases} d + n = 25 \\ 10d + 5n = 200 \end{cases}$ gives $d = 15$ and $n = 10$.
Thus, Paul has 15 dimes and 10 nickels.

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Write a system for each coin problem. Then solve each problem.

3. Raul has $4.32 in pennies and nickels. If Raul has a total of 260 coins, how many of each does he have? ____________

4. Ronnie has 57 nickels and quarters. If Ronnie has $7.25, how many nickels and quarters does he have? ____________

5. Rachel bought 42 stamps for $14.40. How many 32-cent stamps and 40-cent stamps did Rachel buy? ____________

◆ Skill C Solving number-digit problems

Recall To write an equation relating the values of the digits, write the number in expaned form. For example, $32 = 3(10) + 2$.

◆ **Example 1**

The sum of the digits of a two-digit number is 11. The ones digit is less than twice the tens digit. What is the number?

◆ **Solution**

Let t represent the tens digit and let u represent the units digit.
Write a system relating the digits of the number.

Solving $\begin{cases} t + u = 11 \\ u = 2t - 1 \end{cases}$ gives $t = 4$ and $u = 7$.

Thus, the number is 47.

◆ **Example 2**

The sum of the digits of a two-digit number is 14. By reversing the digits, the number is increased by 18. Find the original number.

◆ **Solution**

Let t represent the tens digit and u represent the units digit. Then $t + u = 14$. $10t + u$ represents a two digit number. $10u + t$ represents the number when the digits are reversed. Thus, $10t + u = (10u + t) + 18$.

Solving the system $\begin{cases} t + u = 14 \\ 9t - 9u = 18 \end{cases}$ gives $t = 6$ and $u = 8$.

Thus, the number is 68.

Write a system for each digit problem. Then solve the problem.

6. The sum of the digits of a two-digit number is 12. The ones digit is 3 times greater than the tens digit. What is the number? ____________

7. The sum of the digits of a two-digit number is 10. If you reverse the digits, the new number is one more than twice the original number. Find the original number. ____________

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